circumference of the motor. As is known in the art, dividing the stator winding into a plurality of independently driven phases has the effect of smoothing the output torque of the motor. Typically, three phases are utilized, as a compromise between smooth output torque and efficient design of the power supply and phase driver circuits. Each phase is manufactured having an equal number turns, which is selected based on desired performance characteristics (output speed vs. torque speed) of the motor. As a result, a motor will operate efficiently only within a predetermined range of speed and torque, which is fixed at the time of manufacture of the motor.

[08] Accordingly, an aspect of the present invention provides a stator winding for a brushless DC motor. The stator winding includes one or more phases, each of which comprises at least two segments having a respective plurality of turns. Each phase segment includes a respective tap adapted to enable electrical connection of the segment to a power supply.

[09] The number of turns of each phase segment may be selected based on a desired performance characteristic of the motor.

[10] The segments of each phase may be electrically connected in series. Preferably, means are provided for electrically connecting a selected one of the taps to the power supply. Thus a stator current can be controlled to

flow through a selected one or more of the segments of each phase, by connecting a selected one of the taps to the power supply. In such cases, the number of turns of each series connected segment may be selected such that a total number of turns in which the stator current is flowing yields desired performance characteristics of the motor in a selected speed range.

[11] Thus the present invention provides a stator winding having one or more phases, each of which is divided into a plurality of segments such that the stator current can be controlled to flow within a selected portion of each phase of the winding. The number of "active" turns of each phase (that is, the number of turns in which stator current is flowing) determines the motor performance, and thus the speed range over which the motor will operate efficiently. The overall speed range of the motor can thus be extended by selectively connecting a power supply across one or more segments to thereby dynamically adjust the number of "active" turns of each phase. A permanent magnet brushless DC motor incorporating the stator winding of the present invention can be designed having an overall performance characteristic that is similar to that of a series polar direct current motor. It has a high torque at low speeds, providing good starting and climbing performance of a vehicle incorporating such a motor. Additionally, the motor can operate efficiently at moderate and high speeds.